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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,573	06/02/2006	Nam-Seok Roh	PNK0337US	4907

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EXAMINER	
RAINEY, ROBERT R	
ART UNIT	PAPER NUMBER
2629	

NOTIFICATION DATE	DELIVERY MODE
11/12/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/581,573	ROH ET AL.	
	Examiner	Art Unit	
	ROBERT R. RAINEY	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) *1-4* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments have been fully considered.

2. The amendments to claim 10 effectively overcome the objection to the claim raised in the previous office action.

3. The amendments to claim 10 effectively overcome the 35 USC § 112, 2nd paragraph, rejection of the claim raised in the previous office action.

4. Applicant's arguments with respect to the art rejections of claims 5-14 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 5-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2008/0192178 to *Ben-David et al.* ("*Ben-David*") in view of U.S. Patent Application Publication No. 2005/0088385 to *Elliott et al.* ("*Elliott*").

As to **claim 5**, *Ben-David* discloses a color display and in particular: A display device comprising: a plurality of pixels arranged in matrix (see for

example Fig. 12A, which shows two pixels for example, one shaded and on unshaded), each pixel including first to third pairs of subpixels,

wherein the first pair of subpixels are disposed adjacent to each other (see for example subpixels labeled "G" and "M"), the second (see for example subpixels labeled "R" and "C") and the third pairs of subpixels (see for example subpixels labeled "B" and "Y") are disposed opposite each other with respect to the first pair of subpixels (note that the second and third subpixel sets are on opposite sides of the first set), and the first to the third pairs of subpixels include first-color subpixels and second-color subpixels (note that six colors are shown so the requirement that two colors are used is met; as an aid to further prosecution examiner notes that the art cited would also read on a claim that required that each of the first to third subpixel pairs included one first-color subpixel and one second-color subpixel); and wherein the first pair of subpixels is surrounded by the second pair of subpixels and the third pair of subpixels (see for example Fig. 12A, note that R, C, B and Y together surround G and M; note that although applicant argued that "surrounded" describes the condition of Fig. 7 and 8 of the instant application, examiner agrees with Webster's that "SURROUND is a general term not esp. rich in connotation" and that at least definition 2h describes the situation of Fig. 12A; "2 [influenced in meaning by ^{6}round] : to be situated or found around, about, or in a ring around: as … h : to occur or be next, near, adjacent to, or before and after in a sequence or order" Copyright © Webster's Third New International Dictionary, Unabridged, Copyright

Ben-David does not expressly disclose that the entire edge of the first pair of subpixels is enclosed by the second pair of subpixels and the third pair of subpixels.

Elliott discloses a subpixel rendering method and its use in with pixels of multiple known subpixel arrangements including two that are six-subpixel repeat cells (see for example Fig. 13 items 1320 and 1323 and [0098]); one of which has a row and column arrangement (see for example Fig. 13 item 1320) and one of which has six substantially triangular shaped segments with two of the triangular shaped segments arranged to form a rectangular central section and the other for arranged proximate the sides of the central section in such a manner that the six segments combine to form a second substantially rectangular section, i.e. a "2-4" arrangement (see for example Fig. 13 item 1323); and that in the 2-4 arrangement the entire edge of the first pair of subpixels is enclosed by the second pair of subpixels and the third pair of subpixels (see for example Fig. 13 item 1323; note that the rectangle formed by the central two subpixels is entirely enclosed by the rectangle formed by the outer four subpixels).

Ben-David and *Elliott* are analogous art because they are from the same field of endeavor which is matrix displays.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to substitute the 2-4 arrangement, in which the entire edge

of the first pair of subpixels is enclosed by the second pair of subpixels and the third pair of subpixels, for the row and column arrangement of *Ben-David*. The suggestion/motivation would have been to use an art recognized substitute ([0098] makes it clear that these are both known "six subpixel repeat cells").

As to **claim 6**, in addition to the rejection of claim 5 over *Ben-David* and *Elliott*:

Ben-David does not expressly disclose that each subpixel in the first pair of subpixels is triangular, and the first pair of subpixels form a diamond.

Elliott further discloses that each subpixel in the first pair of subpixels is triangular, and the first pair of subpixels form a diamond (see for example Fig. 13 item 1323, with the first pair of pixels being the two in the center forming a diamond).

As to **claim 7**, in addition to the rejection of claim 6 over *Ben-David* and *Elliott*, *Elliott* further discloses that a boundary between the first pair of subpixels extends in a row or column direction (see for example Fig. 13 item 1323).

As to **claim 8**, in addition to the rejection of claim 7 over *Ben-David* and *Elliott*, *Ben-David* further discloses that the first-color and the second-color subpixels have complementary relation (see for example Fig. 12A the fact that

the colors are used together in a pixel indicates that they have a complementary relation).

As to **claim 9**, in addition to the rejection of claim 8 over *Ben-David* and *Elliott*, *Ben-David* further discloses that a group consisting of the first-color subpixels include red green, and blue subpixels (see for example Fig. 12A R, G, and B) and a group consisting of the second-color subpixels include cyan, magenta, and yellow subpixels (see for example Fig. 12A C, M, and Y).

As to **claim 10**, in addition to the rejection of claim 8 over *Ben-David* and *Elliott*:

Ben-David further discloses that a group consisting of the first-color subpixels include red green, and blue subpixels (see for example Fig. 12A R, G, and B) and a group consisting of the second-color subpixels include cyan, magenta, and yellow subpixels (see for example Fig. 12A C, M, and Y); and

Elliott further discloses the replacement of one subpixel of a six subpixel repeat cell or pixel being replaced with a white element (see for example Fig. 13 items 1320 and 1323 and [0084]-[0085]).

Ben-David and *Elliott* disclose the claimed invention except for the replaced subpixel being the M subpixel.

Since the prior art device offered only six choices of subpixel colors to replace – R, G, B, C, M or Y – one of ordinary skill in the art could have pursued

the known potential solutions/replacements, with a reasonable expectation of success.

As to **claim 11**, *Ben-David* discloses a color display and in particular: A display device comprising: a matrix of pixels (see for example Fig. 12A, which shows two pixels for example, one shaded and on unshaded), each pixel including a pair of central subpixels (see for example subpixels labeled "G" and "M") adjacent to each other, a pair of first subpixels (see for example subpixels labeled "R" and "C"), and a pair of second subpixels (see for example subpixels labeled "B" and "Y"), the pairs of first and second subpixels disposed in diagonals with respect to the central subpixels (see for example Fig. 12A noting that the subpixels labeled "R" and "Y" are diagonally disposed with respect to the central subpixels, as are the subpixels labeled "C" and "B"); a plurality of gate lines extending in a row direction and transmitting gate signals; and a plurality of data lines extending in a column direction and transmitting data signals, wherein each subpixel includes a pixel electrode and a thin film transistor (see for example [0003] especially "active-matrix technology"), the subpixels include first and second sets of three primary color subpixels (see for example Fig. 12A, the unshaded six subpixels with first color set being RGB and the second color set being CMY), and the first and the second sets of three primary color subpixels have complementary relation (that the colors are used together in a pixel indicates that they have a complementary relation); and wherein the first pair of

subpixels is surrounded by the second pair of subpixels and the third pair of subpixels (see for example Fig. 12A, note that R, C, B and Y together surround G and M; note that although applicant argued that "surrounded" describes the condition of Fig. 7 and 8 of the instant application, examiner agrees with Webster's that "SURROUND is a general term not esp. rich in connotation" and that at least definition 2h describes the situation of Fig. 12A; "2 [influenced in meaning by ^{6}round] : to be situated or found around, about, or in a ring around: as ... h : to occur or be next, near, adjacent to, or before and after in a sequence or order" Webster's Third New International Dictionary, Unabridged, Copyright © 1993 Merriam-Webster, Incorporated. Published under license from Merriam-Webster, Incorporated and Copyright © 2001-2009 ProQuest LLC.).

Ben-David does not expressly disclose that the entire edge of the first pair of subpixels is enclosed by the second pair of subpixels and the third pair of subpixels.

Elliott discloses a subpixel rendering method and its use in with pixels of multiple known subpixel arrangements including two that are six-subpixel repeat cells (see for example Fig. 13 items 1320 and 1323 and [0098]); one of which has a row and column arrangement (see for example Fig. 13 item 1320) and one of which has six substantially triangular shaped segments with two of the triangular shaped segments arranged to form a rectangular central section and the other for arranged proximate the sides of the central section in such a manner that the six segments combine to form a second substantially rectangular

section, i.e. a “2-4” arrangement (see for example Fig. 13 item 1323); and that in the 2-4 arrangement the entire edge of the first pair of subpixels is enclosed by the second pair of subpixels and the third pair of subpixels (see for example Fig. 13 item 1323; note that the rectangle formed by the central two subpixels is entirely enclosed by the rectangle formed by the outer four subpixels).

Ben-David and *Elliott* are analogous art because they are from the same field of endeavor which is matrix displays.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to substitute the 2-4 arrangement, in which the entire edge of the first pair of subpixels is enclosed by the second pair of subpixels and the third pair of subpixels, for the row and column arrangement of *Ben-David*. The suggestion/motivation would have been to use an art recognized substitute ([0098] makes it clear that these are both known "six subpixel repeat cells").

As to **claim 12**, in addition to the rejection of claim 11 over *Ben-David* and *Elliott*:

Elliott further discloses that each of the central subpixels is isosceles triangular and the central subpixels form a diamond (see for example Fig. 13 item 1323, with the first pair of pixels being the two in the center forming a diamond).

As to **claim 13**, in addition to the rejection of claim 12 over *Ben-David* and *Elliott*, *Elliott* further discloses that a boundary between the central subpixels extends in a row or column direction (see for example Fig. 13 item 1323).

As to **claim 14**, in addition to the rejection of claim 13 over *Ben-David* and *Elliott*, the limitations that the first set of three primary color subpixels include red green, and blue subpixels, and the second set of three primary color subpixels include cyan, magenta, and yellow subpixels were already covered in the rejection of claim 11 since RGB = red, green, blue, and CMY = cyan, magenta, yellow.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT R. RAINEY whose telephone number is (571)270-3313. The examiner can normally be reached on Monday through Friday 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on (571) 272-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RR/

/Amare Mengistu/

Supervisory Patent Examiner, Art Unit 2629